

ANNUAL REPORT

1962

VILLAGE OF THEDFORD

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THEDFORD WATER TREATMENT PLANT

OPERATED FOR

THE VILLAGE OF THEDFORD

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider	-	Chairman
Dr. A. E. Berry	-	General Manager
Mr. D. S. Caverly	-	Assistant General Manager, and Director of Plant Operations
Mr. B. C. Palmer	-	Assistant Director, Division of Plant Operations
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Prepared by the
Division of Plant Operations

THEDFORD WATER TREATMENT PLANT

PROJECT DEVELOPMENT

The Village of Thedford approached the Ontario Water Resources Commission in 1959 to undertake the financing and operation of a water distribution system for the community.

The system was designed by M. M. Dillon and Company Limited of London and construction began in July of 1960. International Water Supply Limited of London were responsible for the location and development of a deep well and Graham & Graham Limited, also of London, were contractors for construction of the well house, reservoir and booster station, installation of the pumping equipment, and construction of the distribution system.

In early spring of 1960, test drilling began and a deep well sufficient to supply the community was located and developed. Construction began in July and the system was placed in operation in December of 1960.

The new water system was officially opened on July 21, 1961 by Mr. J. W. Murphy, M.P.P., and assisted by Mr. C. E. Janes, M.P.P.

The system is operated for the Village by Mr. Walter Carrothers, under the supervision of the Division of Plant Operations of the OWRC.

DESCRIPTION OF THE SYSTEM

General Description

The supply of water is obtained from a deep well located approximately one and one half miles north of the Village on the fourth concession road of the Township of Bosanquet.

From this point the water is pumped through a four inch main to the reservoir and booster pumping station located at the corner of King and North Streets. From here the water is pumped through distribution mains to the Village.

Well House

The water is pumped at a rate of 60 IGPM from the deep well to the booster station by a Layne Centrifugal Turbine Pump equipped with a U.S. Holloshaft 5 H.P. motor.

A control valve automatically maintains a constant operating pressure of 80 P.S.I. between the well and booster station reservoir.

Booster Pumping Station

The Booster Station contains two electrically operated vertical Layne Turbine pumps. Each pump has a $7\frac{1}{2}$ HP U.S. Holloshaft motor and is capable of 120 IGPM. One of the pumps is connected to a stand-by gasoline engine for use during any power failure.

The water is pumped through the hydro-pneumatic tank used to maintain water pressure in the distribution mains at approximately 40 P.S.I. The pressure is maintained by keeping 35% of the tank filled with water and 65% filled with air. A combination float and pressure switch automatically controls the operation of both pumps and the hydro-pneumatic tank air compressor.

Reservoir

The storage reservoir has a capacity of 50,000 Imperial Gallons.

Distribution System

Mains of approximately 18,500 feet of 4 inch and 11,500 feet of 6 inch asbestos cement are constructed on the following streets :-

Dumfries	Louisa	Deacon	Main
King	Pheraill	Allen	Elizabeth
Sherrard	North	Third	Second
Mill	Anne	Victoria	Royal
Ontario	Pearl	Nelson	Concession Rd.

There are 15 hydrants connected to the service lines.

PROJECT OPERATION STATEMENT

MONTH	EXPENDITURE	POWER	CHEMICAL	GENERAL SUPPLIES	REPAIR & MAINT.	SUNDRY
Jan.	110.87	110.87				
Feb.	101.92	101.92				
Mar.	105.69	105.69				
Apr.	106.51	96.69				9.82
May	87.95	35.84				52.11
June	278.18	139.75	17.50	37.79	83.14	
July	105.16	78.35		26.81		
Aug.	105.43	77.00				28.43
Sept.	111.63	78.32		33.31		
Oct.	96.04	81.83				14.21
Nov.	81.05	81.05				
Dec.	159.64	91.26				68.38
TOTAL:	1450.07	1078.57	17.50	97.91	83.14	172.95

Cost Per 1000 Gallons = $\frac{1450.07}{10,244}$ = 14.15 ¢

POWER COSTS

MONTH		TOTAL CONSUMPTION	1st Rate	2nd Rate	3rd Rate	Service Charge	Total Gross	Bill Net
Jan.	(T)	2875	1313	1313	249	13.13	44.15	39.73
	(H)	2440				20.25	69.10	62.19
Feb.	(T)	4575	1313	1313	1949	13.13	49.76	44.78
	(H)	2010				20.25	67.68	60.91
Mar.	(T)	2050	1313	737		13.13	40.44	36.40
	(H)	1800				20.25	66.99	60.29
Apr.	(T)	1925	1313	612		13.13	39.82	35.84
	(H)	1330				20.25	61.92	55.73
May	(T)	1400	1313	87		13.13	37.20	33.48
	(H)	1090				20.25	56.16	50.54
June	(T)	750	750			15.00	28.50	25.65
	(H)	750	440			20.25	58.56	52.70
July	(T)	450	450			13.13	21.23	19.11
	(H)	1430				20.25	64.32	57.89
Aug.	(T)	775	775			15.00	28.95	26.05
	(H)	1170				20.25	58.08	52.27
Sept.	(T)	1125	1125			15.00	35.25	31.72
	(H)	1070				20.25	55.68	50.11
Oct.	(T)	650	650			15.00	26.70	24.03
	(H)	1390				20.25	63.36	57.02
Nov.	(T)	1825	1125	700		11.25	35.00	31.50
	(H)	750	750			20.25	66.40	59.76
Dec.	(T)	3400	2000	1400		20.00	73.00	65.70
	(H)	750	750			20.25	69.23	62.31
TOTAL:		37780				418.03	1,217.48	1,095.71
AVG:		3200				35.00	100.00	90.00

$$\text{Power Cost Per Million Gallons} = \frac{1,095.71}{10.244} = \$106.96$$

MONTH	AVERAGE DAILY FLOW	TOTAL WEEKLY FLOW	TOTAL MONTHLY FLOW	MINIMUM FLOW	MAXIMUM FLOW
<u>JANUARY</u>					
1 - 6	22,215	133,290		17,500	26,350
7 -13	22,617	158,320		20,120	27,040
14-20	23,191	162,340		19,910	28,820
21-27	27,938	195,570		22,150	32,580
28-31)		92,780		18,780	25,800
<u>FEBRUARY</u>)			<u>742,300</u>		
1 - 3)	24,975	82,050		21,390	34,760
4 -10	26,700	186,900		13,260	35,340
11-17	24,527	171,690		19,600	27,750
18-24	26,744	187,210		22,740	32,970
25-28)		118,730		18,650	42,750
<u>MARCH</u>)			<u>746,580</u>		
1 - 3)	28,266	79,130		21,060	30,080
4 -10	21,656	151,590		15,830	29,850
11-17	31,014	217,100		16,500	51,920
18-24	25,163	176,140		19,750	50,250
25-31)	21,543	150,800		20,910	23,230
<u>APRIL</u>)			<u>774,660</u>		
1 - 7)	21,171	148,194		17,280	31,190
8 -14	18,619	130,330		21,370	29,120
15-21	18,771	131,400		14,670	23,960
22-28	21,511	150,580		15,820	32,400
				Cont'd	

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MONTH	AVERAGE DAILY FLOW	TOTAL WEEKLY FLOW	TOTAL MONTHLY FLOW	MINIMUM FLOW	MAXIMUM FLOW
<u>APRIL</u>					
29-30)		48,120	<u>608,624</u>	21,280	26,840
<u>MAY</u>					
1 - 5)	21,374	101,500		17,620	28,560
6 -12	20,711	144,980		13,880	24,450
13-19	32,704	228,931		20,350	42,431
20-26	30,680	214,759		18,160	43,639
27-31)		183,680	<u>873,850</u>	28,880	54,850
<u>JUNE</u>					
1 - 2)	32,837	46,180		19,810	26,370
3 - 9	29,853	208,970		22,180	41,860
10-16	24,200	169,400		11,780	43,130
17-23	31,196	218,370		16,540	56,710
24-30	33,553	234,870	877,790	23,530	46,380
<u>JULY</u>					
1 - 7	34,390	240,730		22,560	48,800
8 -14	37,926	265,480		23,100	48,920
15-21	39,987	279,910		30,600	53,050
22-28	29,850	208,950		24,000	41,010
29-31)		73,910	<u>1,068,980</u>	17,340	30,630
<u>AUGUST</u>					
1 - 4)	30,957	142,790		27,250	44,910
5 -11	26,557	185,900		16,300	42,610
12-18	27,249	190,740		20,450	34,850
19-25	29,469	206,280		21,270	38.040

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MONTH	AVERAGE DAILY FLOW	TOTAL WEEKLY FLOW	TOTAL MONTHLY FLOW	MINIMUM FLOW	MAXIMUM FLOW
26-31) <u>SEPTEMBER</u>)		182,050	<u>907,760</u>	20,170	42,980
1 -)	34,233	57,580		-----	57,580
2 - 8	24,921	174,450		18,960	41,820
9 -15	28,956	202,690		22,930	43,520
16-22	29,427	205,990		21,780	37,450
23-29	33,177	232,240		22,120	64,170
-30) <u>OCTOBER</u>)		20,990	<u>893,940</u>		
1 - 6)	28,354	177,490			
7 -13	35,023	245,160		22,480	58,750
14-20	25,829	180,800		19,390	33,870
21-27	26,617	186,320		20,490	41,570
28-31) <u>NOVEMBER</u>)		105,830	<u>895,600</u>	23,910	30,690
1 - 3)	31,636	115,620		16,940	22,530
4 -10	26,070	182,490		22,170	32,000
11-17	25,499	178,490		21,600	37,910
18-24	24,750	173,250		22,010	28,840
25-30) <u>DECEMBER</u>)		158,220	<u>808,070</u>	21,920	30,420
1 -)	26,864	29,830		29,830	29,830
2 - 8	32,987	230,910		21,410	66,470
Cont'd					

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MONTH	AVERAGE DAILY FLOW	TOTAL WEEKLY FLOW	TOTAL MONTHLY FLOW	MINIMUM FLOW	MAXIMUM FLOW
<u>DECEMBER</u>					
9 -15	35,459	248,210		30,990	40,980
16-22	33,970	237,790		28,080	40,050
			<u>1,046,240</u>		
23-29	32,230	225,610		28,270	39,340
30-31		73,890		36,440	37,450
	<u>28,066</u>	<u>196,999</u>			

THEDFORDChemical Analysis

During 1962, chemical analyses of the water supply were taken to establish a pattern on which to make future comparisons. These analyses are listed below. In the future, samples for chemical analyses will be collected by engineers of the Ontario Water Resources Commission.

<u>RAW WATER FROM WELL</u>					
MONTH	HARDNESS As CaCO_3	ALKALINITY as CaCO_3	IRON as Fe	CHLORIDE as Cl	pH at Lab
Jan.	64	180	0.22	47	8.1
Feb.	--	---	----	--	---
Mar.	70	204	0.32	44	8.1
April	76	214	0.34	34	8.1
May	74	216	0.32	45	8.1
June	82	212	0.08	43	8.1
July	74	216	0.25	46	8.2
Aug.	--	---	----	--	---
Sept.	76	216	0.20	38	8.1
Oct.	10	212	0.27	49	8.1
Nov.	74	212	0.22	52	8.0
Dec.	--	---	----	--	---
<u>AVG:</u>	67	209	0.25	44	8.1

<u>WATER LEAVING PUMPHOUSE</u>					
MONTH	HARDNESS As CaCO_3	ALKALINITY as CaCO_3	IRON As Fe	CHLORIDE as Cl	pH at Lab
Jan.	64	196	0.10	46	8.1
Feb.	--	---	----	--	---
Mar.	70	206	0.24	44	8.1
April	70	210	0.24	46	8.2
May	76	220	0.22	46	8.2
June	80	212	0.52	44	8.1
July	74	216	0.25	45	8.3
Aug.	--	---	----	--	---
Sept.	76	210	0.16	45	8.1
Oct.	80	212	0.20	47	8.0
Nov.	74	214	0.30	50	8.2
Dec.	--	---	----	--	---
<u>AVG:</u>	74	211	0.25	46	8.2

Hardness

The average hardness from the Thedford Well is 67 ppm. In general, water softer than 50 ppm is corrosive, whereas, water harder than about 80 ppm leads to excessive consumption of soap. The recommended desirable range of hardness is between 50 ppm and 80 ppm with 80 to 150 ppm as passable and over 150 ppm as undesirable.

Alkalinity

To prevent serious corrosion of iron distribution systems, the alkalinity should be in the range of 30 - 100 ppm.

Because the alkaline salts are very common in the ground, most waters are more or less alkaline. At a pH of 8.1 , an alkalinity of 209 ppm is reasonable.

Iron

To prevent staining of laundry and plumbing fixtures and to avoid the growth of Crenothrix (iron bacteria) the iron concentration should be less than 0.3 ppm. A concentration of 1.0 ppm is noticeable in the taste of coffee or tea.

Chloride

It is found that some people notice a brackish taste imparted by 100 ppm of chlorides, whereas others are satisfied with concentrations as high as 250 ppm.

BACTERIOLOGICAL RESULTS

During 1962 bacteriological samples were taken once a week to check on the quality of the water. These results show that in general the water is of Grade A quality showing no coliform bacteria. It is believed that the odd sample which was Grade B was due to faulty sampling procedure.

BACTERIOLOGICAL EXAMINATION

Date	Raw Water From Well	Water Leaving Pump house	# 3 Sample Point	# 4 Sample Point
Jan. 4	A	A	A	A
Apr.19	A	A	A	A
Apr.26	A	A	A	A
May 3	A	B	A	A
May 10	A	A	A	A

Date	Raw Water From Well	Water leaving Pump house	# 3 Sample Point	# 4 Sample Point
May 17	C	A	A	A
May 25	B	A	A	A
May 30	A	A	A	A
June 8	A	A	A	A
June 13	A	A	A	A
June 20	A	A	A	A
June 27	A	A	A	A
July 5	A	A	C	A
July 11	A	C	A	A
July 18	A	A	A	A
Aug. 2	A	A	A	A
Aug. 9	A	B	A	A
Aug. 16	A	B	A	A
Aug. 23	A	B	A	B
Aug.30	A	B	A	B
Sept.10	A	A	A	A
Sept.13	A	A	A	A
Sept.20	A	B	A	A
Sept.26	A	A	A	B
Oct. 4	A	B	A	A
Oct. 15	A	A	A	A
Oct. 18	A	A	A	A
Nov. 1	A	B	A	A
Nov.2	A	A	A	A
Nov. 8	A	A	A	A
Nov.14	-	B	A	A
Nov.22	A	A	A	A

Date	Raw Water From Well	Water Leaving Pump house	# 3 Sample Point	# 4 Sample Point
Nov. 29	A	A	A	A
Dec. 4	-	A	-	-
Dec. 5	A	A	A	A
Dec. 11	A	A	A	A
Dec. 19	A	A	A	A
Dec. 27	-	A	A	A

OPERATION

Early in the evening of June 11, 1962, the 5 HP well head pump was completely burned out as a result of lightning.

It was arranged with International Water Supply Company to remove the motor, have it rewound and back in service within 48 hours. The cost of repairs was covered by the insurance.

There were minor difficulties with the pump control mechanisms.

On Thursday, April 12, 1962 a meeting was held to discuss the problem of the recurring break in the watermain between the well and the booster station.

On Tuesday, April 10, 1962 a break occurred in the watermain between the well and the booster station. The break occurred at approximately station 37 + 00 due to the movement of a hill in which the pipe is located.

A similar break occurred in the same location the previous year at approximately the same time of year. It has

been decided to repair each break as they occur with a repair clamp rather than spend considerable money in paying flexible pipe or rerouting the pipeline.

This pipeline break was discussed at the April 12, 1962 meeting of the Thedford Local Advisory Committee.

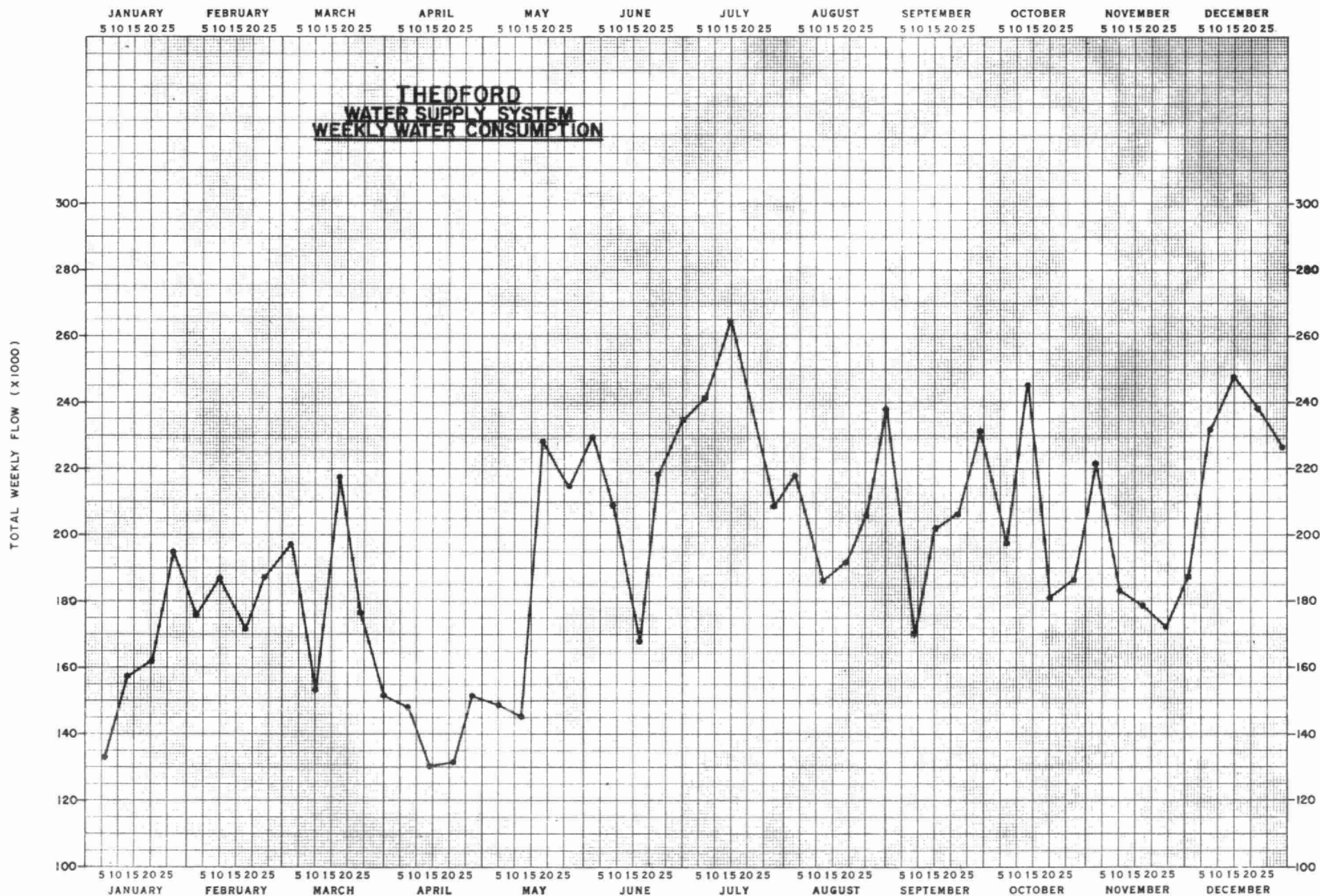
INSPECTIONS

In 1962, the water treatment plant at Thedford was visited for the purpose of inspection on four occasions by project engineers from the Division of Plant Operations of the OWRC. In addition, the Electronics Section made five trouble calls and the Maintenance Section made one inspection trip which is taken annually to check thoroughly every piece of equipment in the plant.



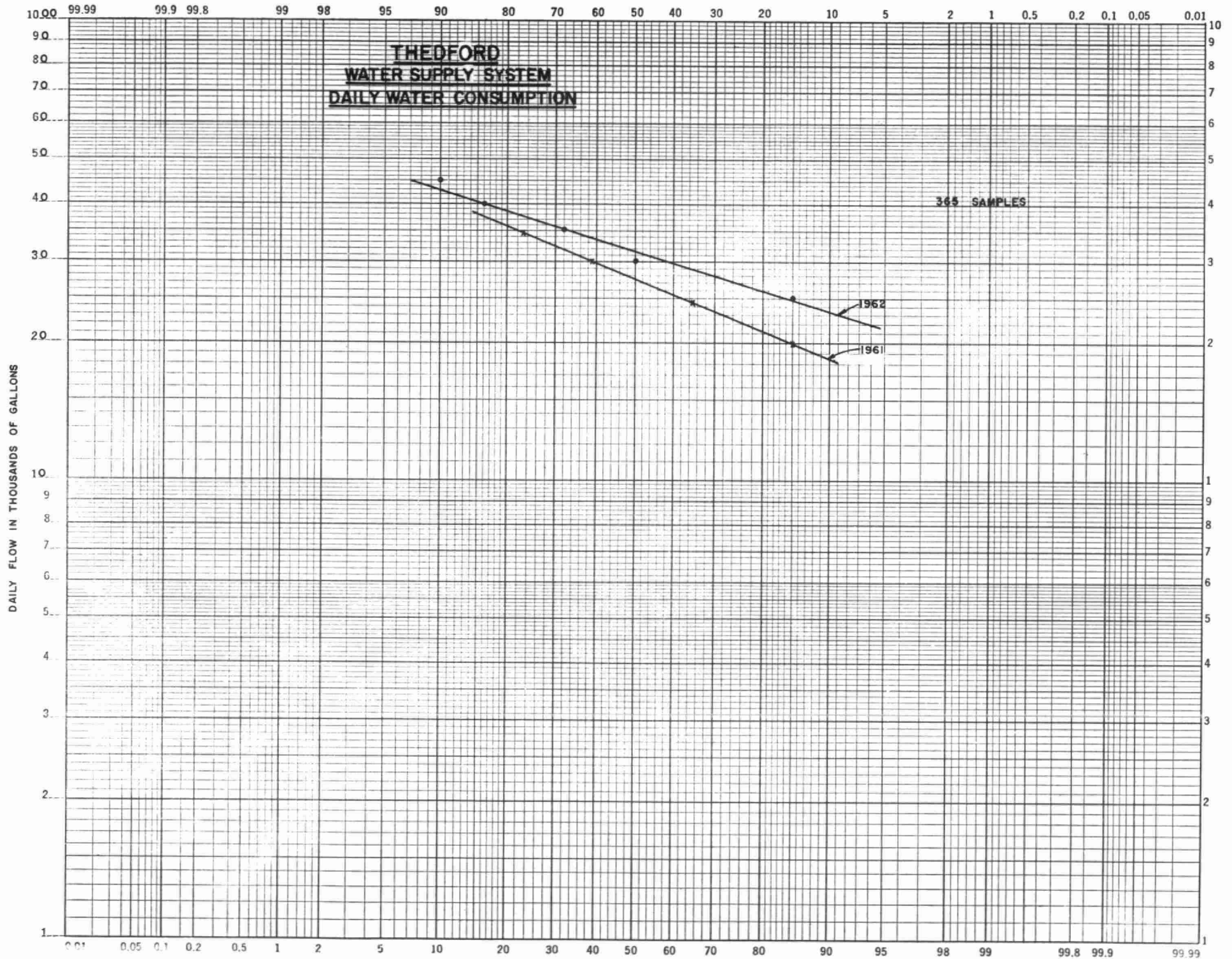
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